forestry, fisheries and the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

SALDANHA BAY SEA BASED AQUACULTURE DEVELOPMENT ZONE SPECIALIST ENVIRONMENTAL MONITORING

QUARTER 1 REPORT

31 March 2024

ANCHOR
research & monitoring

Anchor Research and Monitoring Report No. 2152/2

1 INTRODUCTION

The Marine Living Resources Fund (MLRF), a Schedule 3A Public Entity established in terms of the Public Finance Management Act, 1999 (Act No 1 Of 1999), under the auspices of Department of Forestry, Fisheries and the Environment (DFFE), has appointed Anchor Research & Monitoring (Pty) Ltd, part of the Anchor Environmental group of companies, to undertake specialist monitoring according to the updated environmental Sampling Plan (DFFE 2022) for the sea-based Aquaculture Development Zone (ADZ) located within Saldanha Bay in the Western Cape, in compliance with the stipulations in the Environmental Authorisation (EA) and the Environmental Management Programme (EMPr) for the ADZ, for a contract period of three years 2024-2026.

An ADZ comprises areas of water selected for their suitability for specific aquaculture sectors. The Saldanha Bay ADZ provides opportunities for existing aquaculture operations to expand and new ones to be established, providing economic benefits to the local community through job creation and regional economic diversification. ADZs are intended to boost investor confidence by providing 'investment ready' platforms with strategic environmental approvals and management policies already in place, allowing commercial aquaculture operations to be set up without the need for lengthy, complex and expensive approval processes. It is anticipated that ADZs will create incentives for industry growth, provide marine aquaculture services and enhance consumer confidence.

This Quarter 1 monitoring report, the first of the 2024-2026 contract, details activities completed during the months of January to March 2024.

2 MONITORING UNDERTAKEN DURING THE QUARTER

2.1 Retrieval, maintenance and redeployment of oxygen probes and nitrate sensor

A servicing schedule has been drawn up and approved by DFFE. The proposed service interval is every 8 weeks and is shown in Table 1 below. These dates are however subject to change depending on weather conditions and dive team safety; the DFFE scientific and project management team are consulted when service intervals are adjusted based on weather suitability.

For all service intervals, Anchor and DFFE scientific team co-ordinate to ensure that both teams are available on the chosen dates and that the weather is suitable for servicing the instruments. On the agreed service date, Anchor's dive team launches as early as possible from Pepper Bay in Saldanha or Langebaan yacht club to retrieve the existing instruments from Small Bay and Big Bay at the locations provided by the DFFE. The Anchor team also collects a 100 ml water sample from the nitrate sensor location which is given to the DFFE scientific team on return to the jetty. Additionally, the instruments are cleaned and handed over to the DFFE scientific team for data download and servicing. Once the data download has been completed, the batteries of the instruments are checked and replaced if required. The instruments are then placed in new nylon stockings to limit biofouling of the sensors, and Anchor re-deploys the instruments at their original locations using the same dive team.

Table 1. Proposed instrument service schedule 2024-2026.

Service number	Date	Service number	Date
1	15 January 2024 (completed)	10	15 July 2025
2	15 March 2024 (completed)	11	15 September 2025
3	15 May 2024	12	15 November 2025
4	15 July 2024	13	15 January 2026
5	15 September 2024	14	15 March 2026
6	15 November 2024	15	15 May 2026
7	15 January 2025	16	15 July 2026
8	15 March 2025	17	15 September 2026
9	15 May 2025	18	15 November 2026

All four DO instruments and the nitrate sensor were successfully recovered and serviced during field trips undertaken on the 18-19 January 2024 and the 11-15 March 2024. All instruments were redeployed after the January 2024 service, but during the March 2024 service interval the nitrate sensor was retained by the DFFE scientific team to send it in for annual maintenance. The nitrate mooring was left *in situ* at the Small Bay Impact site and the instrument will be redeployed during the May 2024 service interval (provided it has returned from annual maintenance).

2.2 2024 Benthic Chemical Survey

During 11-15 March 2024, ARM scientific divers collected sediment samples from the 35 established and new control and impact sites in Small Bay, Big Bay and North Bay. REDOX potential and photographs were taken of triplicate samples and triplicate replicates have been submitted to the CSIR marine geochemistry laboratory for analyses of acid volatile sulphides. The results of these analyses will be written up including comparison with previous survey results and the criteria specified in the revised Sampling Plan (DFFE 2022). The 2024 annual benthic chemical survey report will be submitted to the DFFE by the 30 June 2024.

2.3 2024 Benthic Macrofauna Survey

Concurrently with the 2024 chemical survey undertaken 11-15 March, benthic macrofauna and sediment samples for analysis of Total Organic Carbon (TOC), Total Organic Nitrogen (TON) and particle size distribution (PSD) were collected from the 35 sampling sites (Figure 1). The macrofauna samples will be separated from remaining sediment, sorted and identified in the ARM laboratory, whilst the TOC & TON samples have been submitted to the CSIR marine geochemistry laboratory and the PSD samples to Scientific Services Laboratory for analyses. The results of the 2024 benthic macrofauna survey inclusive of a comparison with previous surveys, SOB surveys and the thresholds of concern as specified in the Sampling Plan will be included in a written report scheduled for submission at the end of September 2024.

Figure 1. Collection of benthic macrofauna by suction sampler March 2024.

2.4 Taxonomic reference library

A digital invertebrate taxonomic reference library of specimens collected from the soft sediment suction sampling within ADZ precincts and at Control stations, (as per the sampling plan); and of biofouling organisms collected from mariculture infrastructure, has been developed and will be updated with any new species detected. This digital invertebrate taxonomic library consists of a record of photographs and/or photomicrographs of all identified taxa to date.

2.5 Baseline water nutrient concentrations

Water nutrient concentration data (total ammoniacal nitrogen and nitrate) are collected bimonthly during instrument servicing trips from seven sampling stations situated between the finfish precinct and Langebaan Lagoon. Water samples were successfully collected during the January 2024 and March 2024 servicing trips and submitted to Element Materials Laboratory UK for analysis. At the project end in December 2026, the water nutrient results will be summarised and presented in a concise report describing baseline levels against which any future impacts of finfish mariculture can be benchmarked.

2.6 Endangered, Threatened and Protected (ETP) species monitoring

Visual surveys of the presence or absence of Endangered, Threatened and Protected (ETP) species (as per the ETP species lists) are conducted every eight (8) weeks within the four precincts of the ADZ from the Anchor Research boat during the servicing of the bottom moored instruments. The only interaction observed was Kelp and Hartlaub's gulls roosting on buoys in all three precincts and Kelp gulls feeding on long lines that were been hauled in Outer Bay North (Figure 2). The survey ETP Data are recorded in an excel spread sheet template after each field survey. Data collected during the January 2024 and March 2024 surveys are summarised in Figure 3. A total of 2 100 ETP individuals from three taxa were recorded during the January survey and 2 971 ETP individuals from eight taxa during the longer March survey. A greater diversity of ETP species were recorded in the vicinity of the Small Bay precinct (7 species) compared to the Big Bay and Outer Bay precincts (4 species at both), whilst the highest numbers of ETP species were recorded in the vicinity of the Big Bay precinct due to large flocks of common cormorants observed during both surveys undertaken during this quarter.

Figure 2. Kelp gulls feeding on long lines been hauled in Outer Bay North during March 2024.

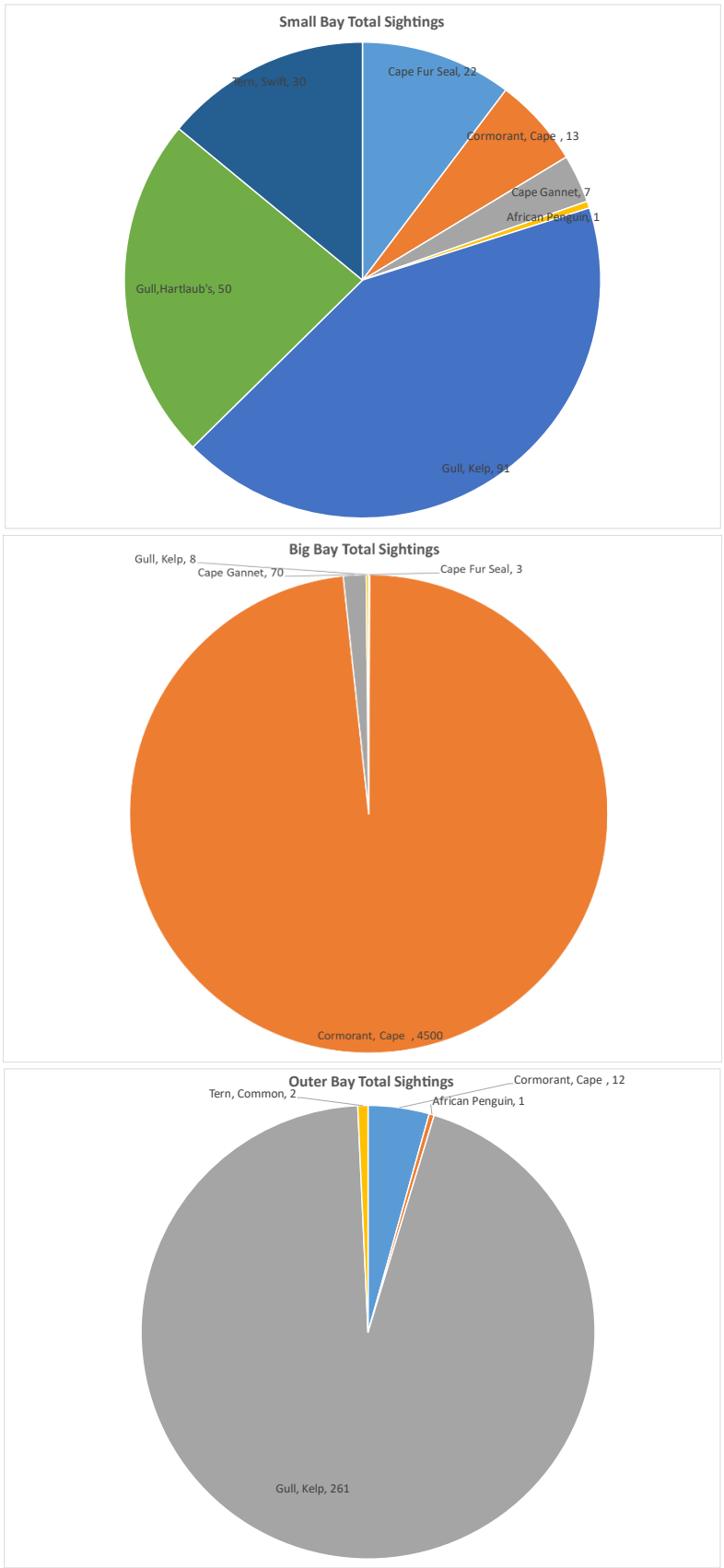

Figure 3. Summary statistics of ETP species counts conducted by ARM during survey trips undertaken 18-19 January 2024 and 11-15 March 2024.

3 PLANS FOR APRIL- JUNE 2024 (Q2)

A single instrument servicing trip is scheduled during the second quarter (service interval 3: 15 May 2024). The servicing dates will be finalised in consultation with DFFE scientific staff the week before dependent on staff availability and weather predictions. During this service trip, surface and bottom water samples for nutrient testing will be collected and ETP species monitoring will be undertaken as per the established protocol.

The annual chemical survey data will be analysed and reported on during this quarter, whilst sorting and identification of the benthic macrofauna samples will be ongoing.

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